Trend Study 10-18-00

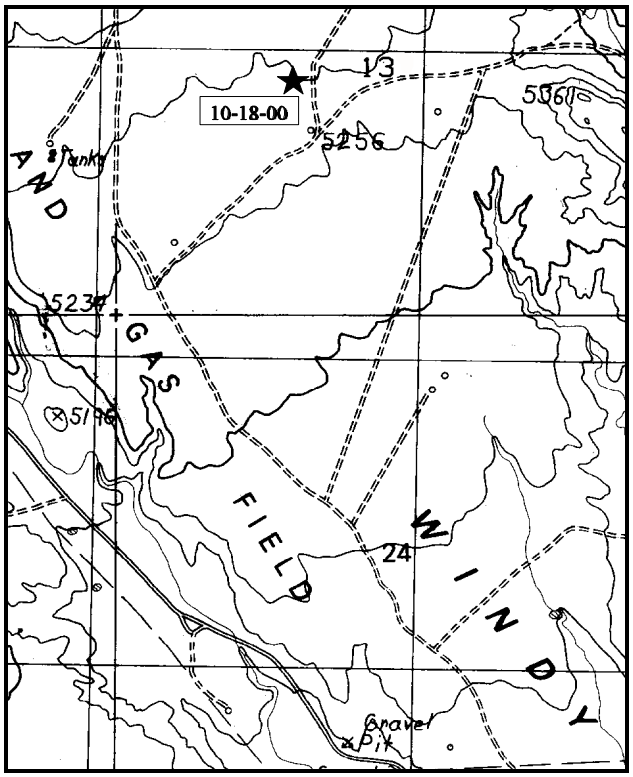
Study site name: East Horse Pasture . Range type: Big Sagebrush-Grass .

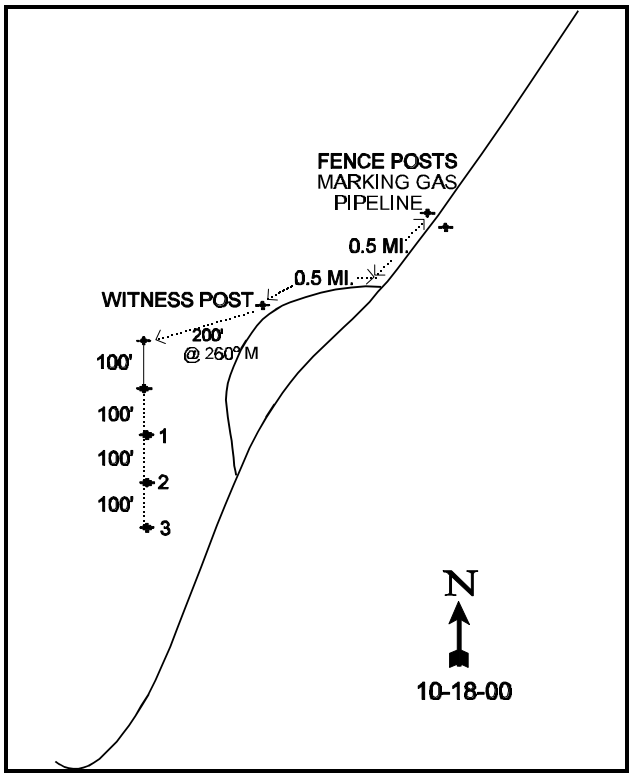
Compass bearing: frequency baseline 165°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From Cunningham Ranch travel south 3.15 miles to a fork. Turn left and go 0.1 miles to a gate. Continue another 0.65 miles to a fork. Stay left (on main road) and continue 0.55 miles to another fork. Turn right and go 0.55 miles to a faint road turning back to the left. Go 0.05 miles on this faint road to a 2-foot tall rebar witness post on the right. The baseline begins 200 feet west of the witness post on a bearing of 245°M. From the first post, the transect runs south at 100 foot intervals.





Map Name: Calf Canyon Diagrammatic Sketch

Township 20S , Range 21E , Section 13 UTM. 4324894.065 N, 625532.556 E

DISCUSSION

Trend Study No. 10-18 (16B-5)

The East Horse Pasture study lies in an area of mixed pinyon-juniper and sagebrush flats located to the east of Nash Wash and the Cunningham Ranch at an elevation of 5,300 feet. This whole general area is managed similarly, as the entire area has very comparable vegetative composition and condition to the other transects in the Nash Wash area. The sagebrush flat where the transect is located has a gentle slope with a south, southeast exposure. Use by wildlife is light at the present time. Pellet group transect data in 2000 estimated 27 deer days use/acre (67 ddu/ha) with no elk use.

The sandy clay loam soil is fine textured and moderately deep. In some areas there are large rocks near the surface, although there is little rock or pavement on the surface or in the profile. Thus the profile stoniness index is more a measure of compaction. Effective rooting depth is estimated at 17 inches with an average temperature of 63°F at 15 inches in depth. The soil is slightly alkaline (pH of 7.4), phosphorus levels are lower than the 10 ppm which have been shown necessary for normal plant growth and development. The soil has a dry crust formed on the surface which is easily broken and disturbed by animals. This crusting could impede seedling establishment. Since cover is poor, except for Wyoming big sagebrush and cheatgrass, any soil disturbance could leave the soil subject to wind and water erosion. There are rills and gullies present with evidence of soil loss, but due to the gentle terrain, erosion does not appear to be excessive. Bare ground is abundant in the shrub interspaces and had an estimated cover value of 28% in 1995, increasing to 44% in 2000. Vegetative cover was estimated at over 43% in 1995, with litter cover providing 48% cover. Both of these decreased in value in 2000, due primarily to the reduction in cheatgrass in association with the drought. Herbaceous vegetation and litter are generally found underneath Wyoming big sagebrush plants and occur only sporadically in the shrub interspaces.

Wyoming big sagebrush is the key species on this site. It visually dominates the site and provides 85% of the browse cover in 2000. Density was estimated at 3,833 plants/acre in 1986, declining to 2,660 plants/acre in 1995, and 2,940 plants/acre in 2000. The decrease between the 1986 reading and the latter two is primarily due to the greatly increased sample size used beginning in mid-1992. This modification more accurately estimates shrub populations with clumped and/or discontinuous distributions. Mature sagebrush plants average just under 2 feet in height with crown measurements averaging nearly 3 feet. In 1986, approximately 90% of the plants showed signs of heavy grazing. This percentage has declined significantly to only 14% and 18% in 1995 and 2000 respectively. The proportion of decadent plants decreased between 1986 and 1995 (60% to 18%), but slightly increased in 2000 to 25%. The proportion of decadent plants that are classified as dying has increased with each reading. In 2000, the decadent/dying plants represented 41% of the decadent plants or about 300 plants/acre. No seedlings and very few young plants have been encountered in any sampling year. Thus, with low recruitment and no biotic potential (# of seedlings), the current age structure for this particular sagebrush population is one of mostly mature plants with moderate decadency. Although grazing intensity has been reduced, it may not be enough for the Wyoming big sagebrush population to fully recover with the competition it receives from cheatgrass. Cheatgrass is the dominant understory plant that provides intense competition with sagebrush seedlings. This competition does not allow the development of seed or the germination and establishment of sagebrush seedlings. If there is little to no green-up of the cheatgrass in the spring or fall (this is currently the situation with extended drought), then the livestock would be forced to utilize the sagebrush. This has been the case most of the time since the late 1980's.

The most numerous shrub in the past was the undesirable broom snakeweed which had an estimated density of 8,860 plants/acre in 1995. Due to drought in 2000, this species decreased by 86% to only 1,220 plants/acre. In the past, snakeweed was vigorous and was the only plant producing seedlings in the shrub interspaces. No seedlings were sampled in 2000. Other shrubs sampled on the site include: fourwing saltbush, winterfat, spiny

hopsage, and a cactus, all of which are in low densities. Junipers appear to be encroaching from the north, but presently, there are none on the site. The nearby stand provides fair resting and thermal cover and the older trees are highlined with the younger ones appearing to be only lightly used.

With the exception of cheatgrass, grasses are scarce and selectively grazed. Cheatgrass was particularly abundant in 1995 due to high early spring precipitation. It produced over 27% average cover in 1995 which represented 94% of the grass cover and 90% of the total herbaceous cover. Due to drought in 2000, cheatgrass currently provides just over 6% average cover representing 56% of the grass cover and 39% of the herbaceous cover. Even with drought, cheatgrass is still the most abundant herbaceous species. Perennial grasses are sparse and include: galleta, bottlebrush squirreltail, and sand dropseed. Galleta and sand dropseed significantly increased in nested frequency in 2000, while squirreltail increased but not significantly. There are no really desirable forbs present. Scarlet globemallow is the most common perennial forb, but is not particularly abundant with a quadrat frequency of only 12% in 2000. Annual forbs as a group currently ('00) make up 81% of the forb cover, with Russian thistle being the most abundant. Because most of the forb composition comes from annual species, many of the forbs encountered on the site are not usually available for grazing animals. This type of range site is not known for its diversity and abundance of herbaceous vegetation, but this site has definitely suffered the effects of long-term overgrazing and drought.

1986 APPARENT TREND ASSESSMENT

The soil and vegetative trends indicated by current management practices appear to be downward. There is inadequate ground cover and soil movement is ongoing. The key species is severely hedged. It will likely become more decadent with no recruitment from young plants into the population for replacement. Besides these problems found in all three transects in the Nash Wash area, there is a continued loss of habitat due to oil and gas leasing and road building. As a very important deer wintering area, it seems necessary to protect and even improve range conditions. Possible solutions are more restrictive oil and gas leasing regulations, manipulation of livestock classes, their distribution and season of use, antlerless hunts to reduce the deer population and implementation of land treatments (chaining) to increase the carrying capacity for wildlife.

1995 TREND ASSESSMENT

Although the grazing pressure appears to be reduced, this Wyoming big sagebrush stand may be past the point of naturally reclaiming itself. The dense cheatgrass understory makes it difficult for sagebrush to produce seed, or for seedlings to become established if they germinate. This has resulted in the creation of a primarily mature or decadent stand. Sagebrush density has declined but the remaining population is healthier. Percent decadency has declined from 60% to 18%. Utilization is also lighter declining from 90% heavy use in 1986 to 14% in 1995. These factors lead to a slightly upward browse trend for Wyoming big sagebrush. The herbaceous understory is comprised primarily of cheatgrass and very few forbs. Although cheatgrass is still very abundant, the total sum of nested frequency for the perennial grass and forbs has increased, leading to a slightly upward herbaceous understory trend. It still is in poor condition. Soil erosion is limited to the disturbed interspaces between the sagebrush. Erosion is not extensive and apparently has not increased since 1986, leading to a stable, yet only fair soil trend.

TREND ASSESSMENT
soil - stable, but only fair condition (3)
browse - slightly upward for Wyoming big sagebrush (4)
herbaceous understory - slightly upward, but poor condition because of high proportion of annuals (4)

2000 TREND ASSESSMENT

Trend for soil is slightly down. Bare ground cover moderately increased in 2000, while vegetation and litter cover decreased. As a result, the ratio of protective ground cover to bare soil decreased also. Trend for the key browse species, Wyoming big sagebrush, is stable but only in fair condition. Percent decadency slightly increased from 18% to 25% with 41% of these classified as dying. Recruitment remains low at 1%. Trend could go down in the future if recruitment remains low and the proportion of decadent dying individuals continues to increase. Heavy use is about the same as in 1995, with moderate use decreasing somewhat. Trend for the herbaceous understory is stable. Sum of nested frequency of perennials slightly increased while the abundance of cheatgrass decreased. However, cheatgrass remains the most abundant herbaceous species even with drought.

TREND ASSESSMENT
soil - slightly down (2)
browse - stable (3)
herbaceous understory - stable (3)

HERBACEOUS TRENDS --
Herd unit 10 , Study no: 18

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'95	'00	'86	'95	'00	'95	'00
G	Bromus tectorum (a)	-	b352	a172	-	97	62	27.40	6.38
G	Festuca ovina	-	-	4	-	-	1	-	.63
G	Hilaria jamesii	a6	b56	c84	2	23	31	1.25	3.27
G	Oryzopsis hymenoides	-	2	-	-	1	-	.00	.01
G	Sitanion hystrix	a4	b19	b28	2	10	13	.27	.47
G	Sporobolus cryptandrus	a-	b14	c32	-	5	13	.05	.55
G	Stipa comata	-	3	3	-	2	1	.03	.00
G	Vulpia octoflora (a)	-	b28	a-	-	13	-	.06	-
Total for Annual Grasses		0	380	172	0	110	62	27.47	6.38
Total for Perennial Grasses		10	94	151	4	41	59	1.61	4.95
Total for Grasses		10	474	323	4	151	121	29.09	11.33
F	Astragalus spp.	-	-	1	-	-	1	-	.00
F	Descurainia pinnata (a)	-	7	3	-	4	1	.02	.00
F	Draba spp. (a)	-	-	1	-	-	1	-	.00
F	Erodium cicutarium (a)	-	a-	b11	-	-	5	-	.21
F	Erigeron utahensis	7	4	-	3	1	-	.00	-
F	Lappula occidentalis (a)	-	b30	a-	-	11	-	.08	-
F	Lactuca serriola	-	3	-	-	1	-	.00	-
F	Leucelene ericoides	a-	b9	b15	-	3	6	.06	.15
F	Lepidium perfoliatum	a-	b31	a3	-	12	1	.06	.03

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'95	'00	'86	'95	'00	'95	'00
F	Machaeranthera grindelioides	-	2	-	-	1	-	.00	-
F	Orobanche corymbosa	3	-	-	3	-	-	-	-
F	Phlox longifolia	6	4	3	3	2	2	.01	.01
F	Plantago patagonica (a)	-	$_{b}$145	$_{a}$-	-	52	-	.28	-
F	Salsola iberica (a)	-	$_{a}$-	$_{b}$106	-	-	42	-	1.35
F	Schoencrambe linifolia	-	2	-	-	1	-	.00	-
F	Sisymbrium altissimum (a)	-	$_{a}$30	$_{b}$51	-	16	18	.18	2.49
F	Sphaeralcea coccinea	15	27	31	7	11	12	.68	.76
F	Unknown forb-perennial	1	-	-	1	-	-	-	-
Total for Annual Forbs		0	212	172	0	83	67	0.57	4.07
Total for Perennial Forbs		32	82	53	17	32	22	0.84	0.96
Total for Forbs		32	294	225	17	115	89	1.41	5.03

Values with different subscript letters are significantly different at % = 0.10 (annuals excluded)

BROWSE TRENDS --
Herd unit 10 , Study no: 18

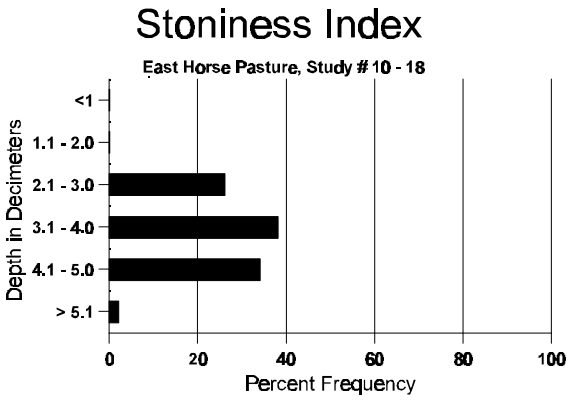
Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia tridentata wyomingensis	65	67	8.57	11.68
B	Atriplex canescens	0	1	-	.00
B	Ceratoides lanata	1	0	-	-
B	Grayia spinosa	1	1	.00	1.01
B	Gutierrezia sarothrae	68	29	2.53	.97
B	Opuntia spp.	5	4	.00	.01
Total for Browse		140	102	11.12	13.68

BASIC COVER --
Herd unit 10 , Study no: 18

Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'86	'95	'00
Vegetation	374	312	8.25	43.52	32.86
Rock	41	5	0	.15	.04
Pavement	53	79	.25	.12	.88
Litter	397	361	56.50	48.29	36.91
Cryptogams	104	80	1.75	2.11	1.41
Bare Ground	268	322	33.25	28.83	44.73

SOIL ANALYSIS DATA --
Herd Unit 10, Study # 18, Study Name: East Horse Pasture

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
17.02	63.4 (15.20)	7.4	48.0	24.0	28.0	1.1	4.5	108.8	0.7



PELLET GROUP FREQUENCY --
Herd unit 10 , Study no: 18

Type	Quadrat Frequency	
	'95	'00
Rabbit	22	23
Elk	1	-
Deer	17	41
Cattle	1	-

Pellet Transect	
Pellet Groups per Acre '00	Days Use per Acre (ha) '00
148	N/A
-	-
357	27 (67)
-	-

BROWSE CHARACTERISTICS --
Herd unit 10 , Study no: 18

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata wyomingensis																		
Y	86	4	-	-	-	-	-	-	-	-	4	-	-	-	133			4
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	86	-	-	-	-	4	38	-	-	-	42	-	-	-	1400	21	23	42
	95	35	54	19	-	1	-	-	-	-	108	-	-	1	2180	22	34	109
	00	49	21	26	8	4	-	-	-	-	108	-	-	-	2160	20	32	108
D	86	-	-	-	-	4	64	-	-	1	58	-	-	11	2300			69
	95	12	12	-	-	-	-	-	-	-	15	-	-	9	480			24
	00	12	19	1	1	4	-	-	-	-	19	-	3	15	740			37
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	520			26
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	640			32

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	07%	90%	10%	-31%
'95	50%	14%	08%	+10%
'00	33%	18%	12%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	3833	Dec:	60%
	'95	2660		18%
	'00	2940		25%

Atriplex canescens																		
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	43	65	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	32	65	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	0	Dec:	-
	'95	0		-
	'00	20		-

Ceratoides lanata																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	11	6	1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	0	Dec:	-
	'95	20		-
	'00	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Grayia spinosa																		
S	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	11	7	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	35	75	0
D	86	-	-	-	-	-	1	-	-	-	1	-	-	-	33			1
	95	-	-	-	-	-	-	1	-	-	-	-	-	1	20			1
	00	1	-	-	-	-	-	-	-	-	-	-	-	1	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	100%	00%	-39%
'95	00%	00%	100%	+ 0%
'00	00%	00%	100%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	33	Dec:	100%
	'95	20		100%
	'00	20		100%

Gutierrezia sarothrae																		
S	86	10	-	-	-	-	-	-	-	-	10	-	-	-	333			10
	95	32	-	-	-	-	-	-	-	-	32	-	-	-	640			32
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	86	52	-	-	-	-	-	-	-	-	52	-	-	-	1733			52
	95	167	-	-	4	-	-	-	-	-	171	-	-	-	3420			171
	00	28	-	-	-	-	-	-	-	-	28	-	-	-	560			28
M	86	95	-	-	-	-	-	-	-	-	95	-	-	-	3166	9	6	95
	95	272	-	-	-	-	-	-	-	-	272	-	-	-	5440	12	12	272
	00	33	-	-	-	-	-	-	-	-	33	-	-	-	660	8	9	33
D	86	5	-	-	-	-	-	-	-	-	5	-	-	-	166			5
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	+43%
'95	00%	00%	00%	-86%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	5065	Dec:	3%
	'95	8860		0%
	'00	1220		0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Opuntia spp.																		
S	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	86	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	86	2	-	-	-	-	-	-	-	-	2	-	-	-	66	5	4	2
	95	4	-	-	-	-	-	-	-	-	4	-	-	-	80	5	14	4
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80	4	14	4
D	86	3	-	-	-	-	-	-	-	-	3	-	-	-	100			3
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	-50%
'95	00%	00%	00%	-20%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	199	Dec:	50%
	'95	100		0%
	'00	80		0%